Counting in quarters

Learning focus

In this lesson, children will learn how to count in quarters. Children will work out how many quarters are needed to make one whole.

Small steps

- Previous step: Counting in halves
- **This step: Counting in quarters**
- Next step: Describing movement

NATIONAL CURRICULUM LINKS

Year 2 Non-statutory guidance

Pupils should count in fractions up to 10, starting from any number.

ASSESSING MASTERY

Children can count in quarters and know when to say the next whole rather than $\frac{4}{4}$. Children can put written fractions in order starting from 0 and can work out how many wholes there are from a number of quarters.

COMMON MISCONCEPTIONS

Children may struggle to make the transition from $\frac{3}{4}$ to the next whole when counting forwards in quarters. This may be particularly challenging when the whole numbers are 3 or 4 because they match the numbers in $\frac{3}{4}$. Provide a number line with whole numbers written on it and intervals of 4 in between each whole number to help children start to make this transition.

STRENGTHENING UNDERSTANDING

If you displayed a number line counting up in halves during the previous lesson, use the same number line and mark on extra intervals for $\frac{1}{4}$ and $\frac{3}{4}$. This will reinforce equivalence between $\frac{1}{2}$ and $\frac{2}{4}$.

GOING DEEPER

When counting forwards in quarters, can children say $\frac{1}{2}$ instead of $\frac{2}{4}$, so that they say $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 rather than $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, 1? If children can do this, are they able to count forwards in quarters from any given number with $\frac{1}{2}$, such as $3\frac{1}{2}$?

KEY LANGUAGE

In lesson: quarters, whole, number line, part, in total, how many?

Other language to be used by the teacher: fraction, intervals, counting forwards, equivalence

STRUCTURES AND REPRESENTATIONS

Number line, number track, 2D shapes

RESOURCES

Mandatory: blank number lines, filled-in number lines showing wholes and four intervals between each whole, number cards showing fractions and whole numbers

Optional: number line from Lesson 13 showing halves, amended to show quarters as well

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

Before you teach

- Did children have any difficulty counting forwards in halves in the previous lesson?
- Are children confident that $\frac{4}{4}$ makes one whole?

Discover

WAYS OF WORKING Pair work

ASK

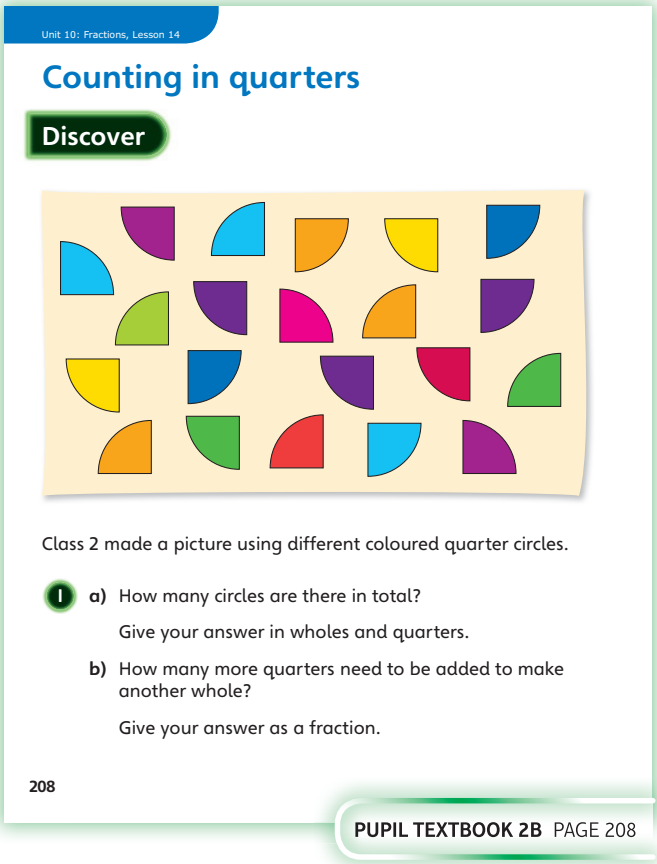
- Question 1 a): *How many quarter circles are there?*
- Question 1 b): *How would you show how many quarter circles there are in one whole?*

IN FOCUS The picture shows a lot of quarter circles all jumbled up so it is not obvious where the original wholes are. When children count the quarter circles, do they count them individually or do they call them quarters?

ANSWERS

Question 1 a): There are five whole circles and one quarter in total.

Question 1 b): We need to add $\frac{3}{4}$ to make a whole (or $\frac{4}{4}$).



Unit 10: Fractions, Lesson 14

Counting in quarters

Discover

Class 2 made a picture using different coloured quarter circles.

1 **a)** How many circles are there in total?

Give your answer in wholes and quarters.

b) How many more quarters need to be added to make another whole?

Give your answer as a fraction.

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Share

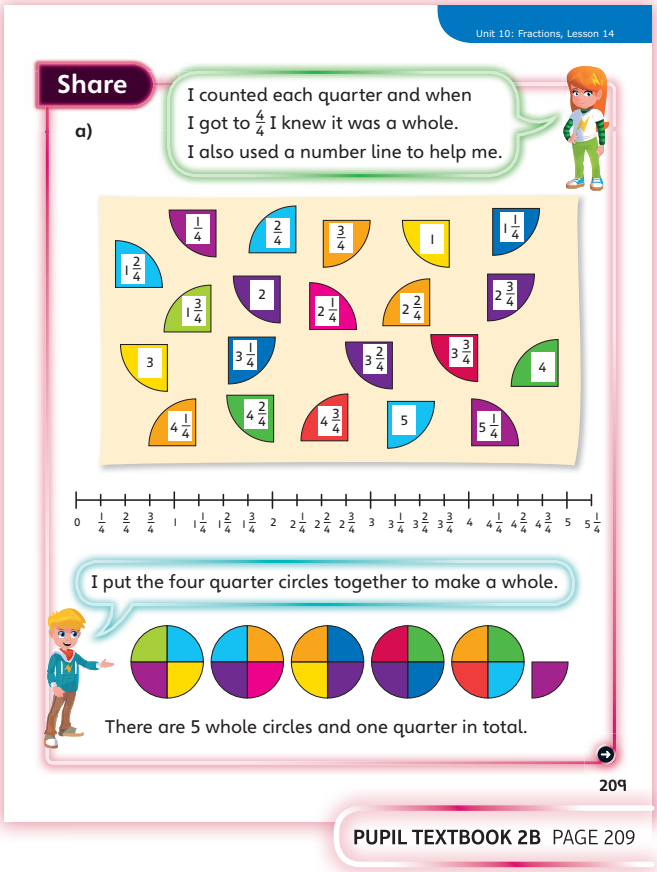
WAYS OF WORKING Whole class teacher led

ASK

- Question 1 a): *Do each of the quarter circles match the fractions on the number line?*
- Question 1 a): *Why have some quarter circles been labelled as whole numbers if you are counting up in quarters?*

IN FOCUS The quarter circles have all been labelled with quarters going from left to right. There is also a corresponding number line underneath the picture to match each quarter circle and check that nothing is missing. The quarters have been rearranged to make it clear how many wholes there are and how many quarter circles are left over.

In question 1 b), Flo points out that only the last quarter circle left over is needed when working out how many quarter circles to add in order to make a whole.



Unit 10: Fractions, Lesson 14

Share

a)

I counted each quarter and when I got to $\frac{4}{4}$ I knew it was a whole. I also used a number line to help me.

I put the four quarter circles together to make a whole.

There are 5 whole circles and one quarter in total.

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Think together

WAYS OF WORKING Whole class teacher led (I do, We do, You do)

ASK

- Question 1 : *What could these quarters of watermelon look like if they were rearranged?*

IN FOCUS Question 2 shows fraction cards that children are asked to put in order. The quarter circle fractions in the **Share** part of the lesson were already in order, so this extends what children have learned and requires them to apply their knowledge of where the whole numbers go in the sequence.

STRENGTHEN Print the fraction cards in question 2 so children can physically move them around. Prepare an empty number line to put them onto. Flo suggests ordering them in another way to prompt children to try ordering the cards from largest to smallest on the number line.

DEEPEN Question 3 can be reworded so that Jack starts with a certain number of whole chocolate bars, which can be marked on the number line, and he eats $\frac{1}{4}$ each day for nine days. This will require children to count backwards by nine quarters to see how much chocolate Jack has left. Vary the starting numbers so that children count backwards from whole numbers and from numbers with quarters.

ASSESSMENT CHECKPOINT In question 1 , what strategy do children use to group together four quarters of watermelon into one whole?

In question 2 , do children automatically put 0 first when ordering the fractions?

In question 3 , do children understand that each jump and interval on the number line is worth $\frac{1}{4}$?

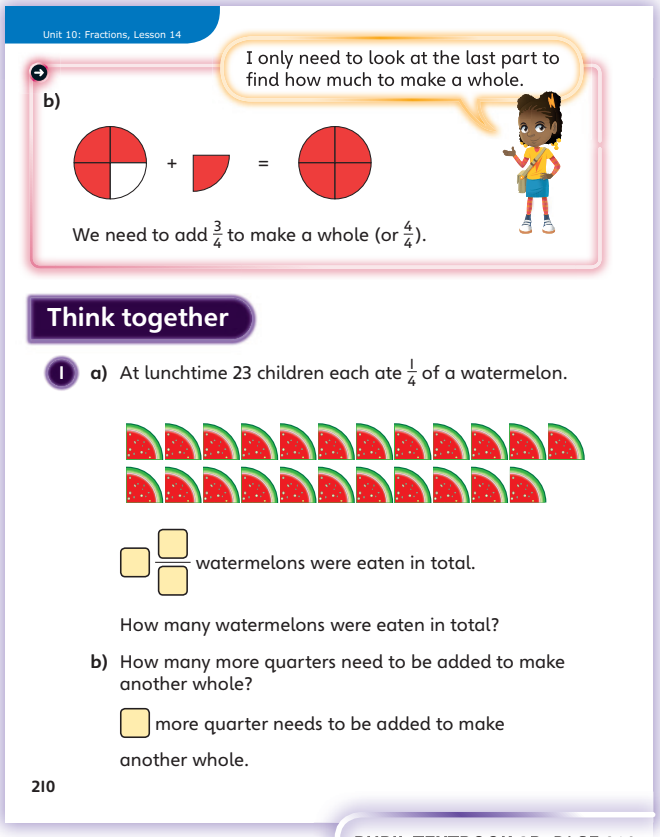
ANSWERS

Question 1 a): $5\frac{3}{4}$ watermelons were eaten in total.

Question 1 b): $\frac{1}{4}$ needs to be added to make another whole.

Question 2 : 0, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{2}{4}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{2}{4}$, $2\frac{3}{4}$, 3

Question 3 : Jack will eat 2 whole bars over nine days.
He will also eat another quarter of a bar.



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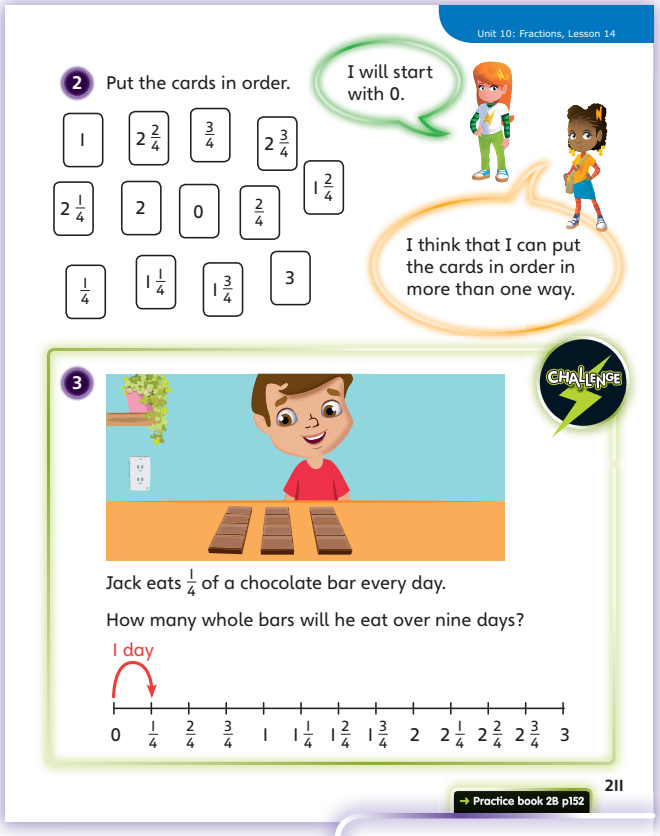

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Practice

WAYS OF WORKING Independent thinking

IN FOCUS In question 5, provide a blank number line to support children when counting forwards in quarters. Ask children to decide their starting point and encourage them to mark enough intervals between each whole number. Discuss the fact that this is a subtraction calculation, which means that children will jump backwards along the number line.

STRENGTHEN When children have answered questions 2 and 3, ask them to create a giant number line of quarters from 0 all the way to 10. This could be done individually or as part of a class project to be displayed in the classroom. Every time a new whole number is reached, this can be represented by using a different colour to write with.

DEEPEN Children who are confident can create their own number line for question 5. Their number line should display equally spaced intervals and the correct number of intervals to show five wholes. Can children write a calculation to match the word problem? Do they know how to represent ten quarters? Do they write this as a fraction, as a written word or as whole numbers and quarters left over?

ASSESSMENT CHECKPOINT In question 1, do children label each quarter or do they circle around four quarters each time and see what is left over? Do children give their answer as the number of quarters they have counted rather than as a whole number?

Do children count backwards from any numbers when filling in the missing numbers in questions 2 and 3?

In question 5, do children understand that they are jumping backwards or do they try to jump forwards? If children have drawn a number line, do they fill in all of the intervals first by counting forwards in order to help them when jumping backwards?

ANSWERS Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.

Reflect

WAYS OF WORKING Independent thinking

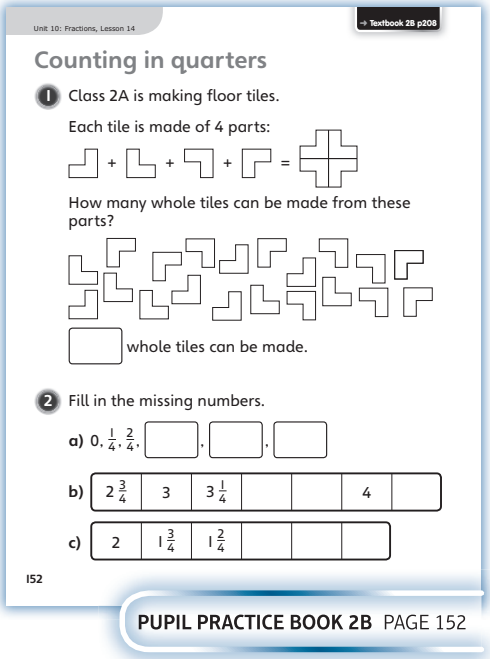
IN FOCUS The **Reflect** part of the lesson requires children to apply what they know about making their own sequences of quarters to fill in the number sentence. Encourage children to indicate in their explanation whether the numbers are getting bigger or smaller and whether the whole needs to go up or down.

ASSESSMENT CHECKPOINT Do children initially spot that the sequence goes up in quarters? Do they mention that the next number could be $1\frac{1}{2}$ as well as $1\frac{2}{4}$?

ANSWERS Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

After the lesson

- Were children able to count backwards as well as forwards in quarters?
- Did children successfully go up or down to the next whole rather than having to write it as a number of quarters?
- Did children show awareness of the equivalence of quarters and halves?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Counting in quarters

1 Class 2A is making floor tiles.

Each tile is made of 4 parts:

How many whole tiles can be made from these parts?

whole tiles can be made.

2 Fill in the missing numbers.

a) 0, $\frac{1}{4}$, $\frac{2}{4}$, ☐, ☐, ☐

b) | $2\frac{3}{4}$ | 3 | $3\frac{1}{4}$ | | | 4 | |

c) | 2 | $1\frac{3}{4}$ | $1\frac{2}{4}$ | | | |

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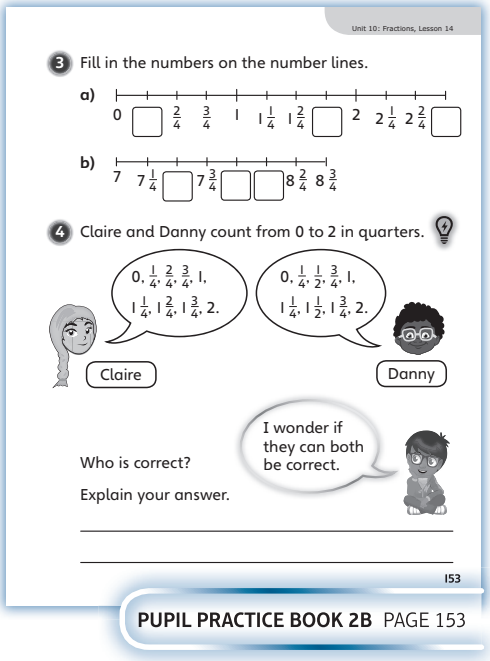
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3 Fill in the numbers on the number lines.

a) 0 ☐ $\frac{2}{4}$ $\frac{3}{4}$ 1 $1\frac{1}{4}$ $1\frac{2}{4}$ ☐ 2 $2\frac{1}{4}$ $2\frac{2}{4}$ ☐

b) 7 $7\frac{1}{4}$ ☐ $7\frac{3}{4}$ ☐ ☐ $8\frac{2}{4}$ $8\frac{3}{4}$

4 Claire and Danny count from 0 to 2 in quarters.

Claire: 0, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{2}{4}$, $1\frac{3}{4}$, 2.

Danny: 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2.

I wonder if they can both be correct.

Who is correct?

Explain your answer.

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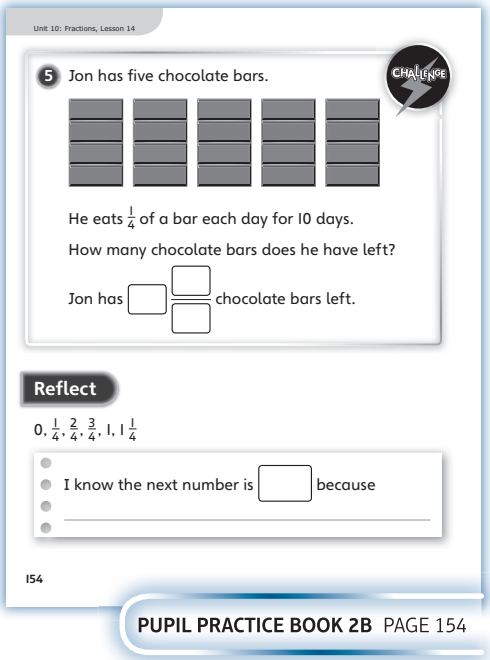
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5 Jon has five chocolate bars.

CHALLENGE

He eats $\frac{1}{4}$ of a bar each day for 10 days.

How many chocolate bars does he have left?

Jon has ☐ ☐/☐ chocolate bars left.

Reflect

0, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$

I know the next number is ☐ because

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